AI RESEARCH PLANNING REWIEW.

A brief overview of AI planning

The *planning* problem in Artificial Intelligence is about the decision making performed by intelligent creatures like robots, humans, or computer programs when trying to achieve some goal. It involves choosing a sequence of actions that will (with a high likelihood) transform the state of the world, step by step, so that it will satisfy the goal. Also the application of Artificial Intelligence (AI) theories and methods are required to enable more efficient space flight control center system.The space flight control planning is a typical knowledge-dealing process, which involves complicated logical reasoning and a large numerous of constraints, and this problem is well suited to AI approaches. Applying AI planning theories, an AI planning method is proposed for space flight control based on planning domain definition language (PDDL).Planning has made significant progress since its inception in the 1970s, in terms both of the efficiency and sophistication of its algorithms and representations and its potential for application to real problems. The STRIPS system made a very important contribution to Planning research by introducing the Strips Assumption as away to avoid the complexity of the frame problem for the purposes of planning within the situation calculus. The assumption is that the only changes that arise on application of an action to a situation are those that are explicitly mentioned as positive effect of actions. **ADL** (Action Description Language) is one of STRIPS extensions which removed some of its constraints to handle more realistic problems. Unlike STRIPS, ADL doesn’t assume that unmentioned literals are false, but rather unknown, what is better known as the Open World Assumption. It also supports negative literals, quantified variables in goals (e.g. ∃x At (P1, x) ∧ At(P2, x)), conditional effects and disjunctions in goals (all not allowed in STRIPS).STRIPS and ADL were inspiration for another extension of representational languages—**PDDL** (Planning Domain Definition Language). It was an attempt to standardize planning languages what made International Planning Competition (IPC) series possible. In other words PDDL contains STRIPS, ADL and much more other representational languages.

Automated planning and scheduling is one of the major fields of AI. Current development of Machine Learning (Deep Learning) or Computer Vision put Planning in the shade (especialy in news and social media). But having in mind that it’s deeply rooted in our lives (factory robots, intelligent vacuum cleaners, planning agents and

more) and its development shapes our future (autonomous cars, drones)—it definitely shouldn't be ignored.

Also the department of Informatics at the Aristotle University of Thessaloniki has investigated the application of AI Planning in e-Learning and composition of semantic web services resulting in two main systems, PASER and PORSCE. PASER is a system for automatically synthesizing curricula using AI Planning and Semantic Web technologies. The use of classical planning techniques allows the system to dynamically construct learning paths even from disjoint learning objects, meeting the learner's profile, preferences, needs and abilities. PORSCE is a system combining an object ranking algorithm and a domain independent planning system in order to semantically search the space of possible compositions of Web services, generating plans according to the desirable level of relaxation set by the user.
Research at the Department of Applied Informatics of University of Macedonia in the last years focused on the problem of scheduling personal tasks that appear in a user's calendar . Results of this research include an enhanced problem formulation, domain-dependent algorithms to solve the scheduling problem , as well as an implemented web-accessible intelligent calendar application called SelfPlanner that allows the user to enter tasks and preferences, solves the optimization problem and presents the resulting plan. SelfPlanner integrates with Google Calendar in order to present the plan, as well as with a Google Maps applications in order to specify location references and compute distances

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